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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/544,108	08/02/2005	Naveen Mysore	85827-103	9971

28291 7590 09/30/2008

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EXAMINER	
PATEL, DHAVAL V	

ART UNIT	PAPER NUMBER
2611	

MAIL DATE	DELIVERY MODE
09/30/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/544,108	Applicant(s) MYSORE ET AL.	
	Examiner DHAVAL PATEL	Art Unit 2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 August 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8,10-22 and 24-36* is/are rejected.

7)☒ Claim(s) *9 and 23* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *02 August 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *7/28/2006*.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in **Graham v. John Deere Co., 383 U.S. 1, 148 USPQ 459 (1966)**, that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows: ***(See MPEP Ch. 2141)***

a. Determining the scope and contents of the prior art;
b. Ascertaining the differences between the prior art and the claims in issue;
c. Resolving the level of ordinary skill in the pertinent art; and
d. Evaluating evidence of secondary considerations for indicating obviousness or nonobviousness.

2. **Claims 1-4,6,10,26, 27, 29-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schilling et al. (US 6,757,322)(hereafter Schilling) in view of Onggosanusi et al. (US 7,133,459) (hereafter Onggosanusi).**

Regarding claims 1, 26 and 27, Schilling discloses a method and system for estimating data transmitted by a plurality of transmit elements (Fig. 1, transmit antennas, TA1....TA4) across a communications channel, comprising:

a) a plurality of receive interfaces (Fig. 3, receiver interfaces, RA1, RA2, RA3, RA4), each receive interface(Fig. 3, receiver interfaces, RA1, RA2, RA3, RA4), operative to receive a signal (col. 2 lines 10-30 discloses spread spectrum sub channel

signals) via the communications channel (col. 2 lines 31-32, communication channel for spread spectrum signals) and output a respective sequence of received data elements (Fig. 3, receiver antennas, col. 2 lines 36-41, each receiver antenna processes spread-spectrum signals);

b) a space matched filter (Fig. 3, matched filters) connected to said plurality of receive interfaces (Fig. 3, receiver interfaces, RA1, RA2, RA3, RA4) and operative to:

i) assemble the received data elements into sets of received data elements (Fig. 3, matched filtering, 24, 34, 44 and 54 are construed as set of data elements from the received data via antenna RA1), each said set of received data elements (Fig. 3, MF1 thru MF4) including at least one received data element from each sequence of received data elements (Fig. 3, set of data construed has received signal from antenna to further process); and

ii) jointly process (Fig. 3, matched filtering) each set of received data elements (Fig. 3, received data elements through received antennas) with each of a plurality of channel data elements (col. 8 lines 21-67 discloses as to how the sequence of data and matched filters process, matched filters matched the impulse response with the received chip sequence) produce a corresponding plurality of filtered data elements (Fig. 3, output of the matched filters are matched filtered data elements), each filtered data element (Fig. 3, output of the matched filter) being associated with one of the transmit elements (Fig. 3, matched filtering retrieve the each sequence of chip data which are transmitted through different transmit antennas, TA1..A4 as shown in Fig. 1) each channel data element (Fig. 3) being representative of a portion of the

communications channel between an associated one of the transmit elements and said plurality of receive interfaces (does not explicitly disclose but would be obvious as explained below);

c) a detector (Fig. 3, FEC decoder, 62 generates soft bit information) connected to said space matched filter (Fig. 3, matched filters 24,34,44,54) and operative to process each filtered data element to produce a corresponding decision data set therefor (Fig. 3, FEC decoder, 62).

But, Schilling does not explicitly disclose as matched filtering in which the each data element being representative of a portion of the communication channel between an associated one of the transmit elements and said plurality of receiver interface and detection of the matched filers data sets.

In the same field of endeavor, Onggosanusi teaches space time transmit diversity scheme in which Fig. 2b teaches down converting the received signal and serial to parallel converter for converting the serial data into parallel data (parallel data are interpreted as set of the data). The parallel data is then provided to match filtering in which received data are matched filtered with channel estimation and channel covariance estimation (Fig. 2b). Furthermore, matched filtering coefficient is calculated as channel estimation for the channel paths from transmitter antenna to receiver antenna (col. 4 lines 61-65) as shown in Fig. 4 discloses that the data received from matched filtering can be parallel data 9 Fig. 4, S/P) and the parallel data are provided to interference resistant detection (construed as detection of parallel data).

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of the invention to combine the teachings of Onggosanusi, into the system of Schilling, as a whole, so as to matched the received chip sequence with the impulse response, the impulse response is a measure of channel between transmit and receiver antennas and detecting the received parallel data for further detection so as to provide parallel data set, the motivation is to provides increased data rates and good performance (col. 2 lines 25-31).

Regarding claim 2, Schilling further discloses the system, wherein each receive interface comprises a respective receive antenna (Fig. 3, receiver antennas, RA1, RA2, RA3 and RA4).

Regarding claim 3, Schilling further discloses the system, wherein said space matched filter (Fig. 3, matched filters) being operative to jointly process each set of received data elements (Fig. 3, matched filters process the received data from each antennas RA1...RA4) with each of a plurality of channel data elements (col. 8 lines 21-67 discloses as to how the sequence of data and matched filters process, matched filters matched the impulse response with the received chip sequence) to produce a corresponding plurality of filtered data elements includes said space matched filter being operative to perform a linear combination of the received data elements in the set of received data elements to produce each of the filtered data elements (Fig. 3, rake and space combiners, 161…164).

Regarding claim 4, Schilling further discloses the system, wherein the number of filtered data elements (Fig. 3, filtered data elements, matched filtering and space and rake combining (Fig. 3, rake and space combining, 161 thru 164) the data produces four signals which are same as the number of transmit antennas (Fig. 1, TA1..TA4) produced from each set of received data elements equals the number of transmits elements.

Regarding claim 6, Schilling does not explicitly disclose the system, wherein the decision data set for a particular filtered data element includes a soft decision data set for the particular filtered data element.

In the same field of endeavor, Onggosanusi teaches maximum likelihood detector as a iterative detector to output a soft output for each possible symbol and a MAP decode would use such detector outputs (col. 5 lines 64-67 and col. 6 lines 6-13).

Therefore, for the same motivation as established for claim 1 above, it would have been obvious to one of ordinary skilled in the art at the time of the invention to combine the teachings of Onggosanusi, into the system of Schilling, as a whole, so as to use such detection technique to provide soft outputs, as taught by Onggosanusi, into the system of Schilling in order to improve data rate and throughput.

Regarding claim 10, Schilling further discloses the system, further comprising a multiplexer (Fig. 3, multiplexer, 132) for combining multiple decision data sets for filtered

data elements (Fig. 3, matched filtered data combining, 161 thru 164) associated with different ones of the transmit elements (Fig. 1, transmit elements, TA1..TA4) into a single sequence of decision data sets (Fig. 3, FEC decoder, 62).

Regarding claim 29, the combined teachings of both Schilling and Onggosanusi discloses all the subject matter explained above.

Schilling furthermore discloses a system for data communication over a multi-input, multi-output (MIMO) channel (claim 25, MIMO), comprising:

a) a transmitter unit (Fig. 1), comprising:

i) a de-multiplexer (Fig, 1, 22) for separating an information stream into a plurality of information sub-streams(Fig. 1, sub streams g1(t), g2(t) etc…);

ii) a plurality of transmit interfaces (Fig. 1, TA1 thru TA4) for simultaneously transmitting respective ones of the information sub-streams (Fig. 1, g1(t).. g4(t)) over the MIMO channel (claim 25, MIMO communication system);

Regarding claim 30, Schilling further discloses the system defined in claim 30, wherein the number of receive interfaces is at leas as great as the number of transmit interfaces (Fig. 1 and Fig. 3)

Regarding claim 31, Schilling further discloses the system defined in claim 31, wherein the number of receive interfaces is less than the number of transmit interfaces (Figs. 1 and 3, one of ordinary skilled in the art would easily modify the current system

with other MIMO system in which receiver antennas are less than the transmit antennas as different diversity scheme)

Regarding claim 32, Schilling further discloses the system defined in claim 31, wherein each transmit interface includes a transmit antenna (Fig. 1, TA1 thru TA4).

Regarding claim 33, Schilling further discloses the system defined in claim 31, wherein the MIMO channel is a wireless channel (claim 25, MIMO and space diversity).

3. **Claims 5 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schilling and Onggosanusi, as applied to claims 1 and 6 above, and further in view of Hochwald et al. (US 7,236,536) (hereafter Hochwald).**

Regarding claim 5, the combined teachings of Schilling and Onggosanusi do not explicitly discloses to generate the filtered data elements to generate hard information data.

In the same field of endeavor, Hochwald teaches generating the received data based on hard decision of the received detected data elements from plurality of antennas (Fig. 1b).

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of the invention to combine the teachings of Hochwald, into the system of both Schilling and Onggosanusi, as a whole so as to generate hard decision filtered data, the motivation is to achieve desired performance (col. 5 lines 61-62).

Regarding claim 7, the combined teachings of Schilling and Onggosanusi discloses the system to generate the filtered data elements (Schilling, Fig. 3, Matched filters) and to generate soft information data (Onggosanusi, col. 5 lines 64-67 and col. 6 lines 6-13).

But, both do not explicitly discloses wherein the soft decision data set for the particular filtered data element includes a set of values, each value in the set of values being indicative of a likelihood or reliability associated with transmission of a corresponding symbol by the transmit element associated with the particular filtered data element.

In the same field of endeavor, Hochwald teaches detection and decoding technique in which invention employs an iterative process to estimate the likelihood that a bit belongs to a particular symbol. a MIMO detector incorporates soft reliability information provided by a channel decoder and channel decoder in its turn incorporates the soft information provided by the MIMO detector and the information between the detector and the decoder is exchanged in an iterative fashion until desired performance is achieved (col. 5 lines 53-62).

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of the invention to combine the teachings of Hochwald, into the system of both Schilling and Onggosanusi, as a whole, so as to provide reliability information for each of the filtered parallel data elements using soft decision, the motivation is to achieve desired performance (col. 5 lines 61-62).

4. **Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schilling, Onggosanusi and Hochwald , as applied to claim 7 above, and further in view of Gorokhov et al. (US 7,397,826) (hereafter Gorokhov).**

Regarding claim 8, the combined teachings of Schilling, Onggosanusi and Hochwald do not explicitly disclose the system, wherein the likelihood or reliability associated with transmission of the corresponding symbol by the transmit element associated with the particular filtered data element includes an a posteriori probability.

In the same field of endeavor, Gorokhov teaches that in soft decision decoding, a FEC decoder generates (soft) real valued metrics that represents the reliability information of the input bits. Usually, each soft metrics is log likelihood ratio, the logarithmic of the ratio of a posteriori probabilities of an input bit being 0 verses a posteriori probabilities of this bit being 1 (col. 7 lines 57-65).

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of the invention to combine the teachings of Gorokhov, into the system of combined teachings of Schilling, Onggosanusi and Hochwald, as a whole, so as to generate the soft decoding using posteriori probability information to retrieve the original data, the motivation is to ensure a better performance (col. 8 lines 2-3).

5. **Claims 11-22, 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schilling and Onggosanusi, and further in view of Ten Brink et al. (EP 0998045) (Hereafter Brink).**

Regarding claim 11, the combined teachings of Schilling and Onggosanusi do not explicitly discloses the system defined in claim 10, further comprising a de-mapper connected to said multiplexer, said de-mapper being operative to produce a soft representation for each decision data set in the sequence of decision data sets.

In the same field of endeavor, Brink teaches de-mapper is a soft de-mapping device that has been modified in order to receive a priori information obtained from the decoder. The iterative decoding and de-mapping can be iterative decoding process whereby the inner decoder is replaced by the soft de-mapping device (page 3, [0016]).

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of the invention to incorporate such de-mapping device, as taught by the Brink, in to the combined system of Schilling and Onggosanusi, as a whole, so as to de-mapping the received decision data based on the soft information generated by the soft decoder or FEC decoder, the motivation is to provide improved bit error rate (page 3, [0016]).

Regarding claim 12, the combined teachings of both Schilling and Onggosanusi, do not explicitly discloses the system defined in claim 11, wherein said de-mapper being operative to produce a soft representation for each decision data set in the sequence of decision data sets includes said de-mapper being operative to assign, to a particular

data set, a numerical value corresponding to a sum of symbol values weighted by the contents of the particular data set.

In the same field of endeavor, Brink teaches de-mapper is a soft de-mapping device that has been modified in order to receive a priori information obtained from the decoder. The iterative decoding and de-mapping can be iterative decoding process whereby the inner decoder is replaced by the soft de-mapping device (page 3, [0016]). Furthermore, it teaches mapping store for storing a plurality of different mappings and means for determining iterations and selecting the optimum mapping information (col. 5 lines 29-51).

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of the invention to incorporate such de-mapping device, as taught by the Brink, in to the combined system of Schilling and Onggosanusi, as a whole, so as to de-mapping the received decision data based on the soft information generated by the soft decoder or FEC decoder, the motivation is to provide improved bit error rate (page 3, [0016]).

Regarding claim 13, Brink furthermore discloses the system defined in claim 12, wherein the symbol values correspond to numerical representations of respective points in a constellation (Figs 4-7, constellation mappings)

Regarding claim 14, , the combined teachings of both Schilling and Onggosanusi do not explicitly discloses the system defined in claim 11, further comprising a decoder

connected to said de-mapper, said decoder being operative to transform the soft representations provided by said de-mapper into a stream information symbols.

In the same field of endeavor, as shown in Fig. 4, decoder is connected to the demapping device to demap the data based on soft information from the decoder. Furthermore, decoder as show in Fig. 4 being operative to transform the soft information provided by the de-mapping device into stream of symbols an dfurther provided to hard decision data to provide the received data (Fig. 4).

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of the invention to incorporate such de-mapping device, as taught by the Brink, in to the combined system of Schilling and Onggosanusi, as a whole, so as to generate the soft valued data based on the de-mapping information, the motivation is to provide improved bit error rate (page 3, [0016]).

Regarding claim 15, Schilling further discloses the system defined in claim 14, wherein said decoder is an error correction decoder (Fig. 3, FEC decoder, 62).

Regarding claim 16, Brink further discloses the system defined in claim 14, wherein said decoder is selected from the group consisting of a turbo decoder, a Reed-Solomon decoder, a convolution decoder and a block decoder (page 2, [0002]).

Regarding claim 17, the combined teachings of both Schilling and Onggosanusi do not explicitly disclose the system defined in claim 14, said decoder being further

operative to generate reliability values on the information symbols, wherein said de-mapper being operative to produce a soft representation for each decision data set in the sequence of decision data sets includes said de-mapper being operative to produce said soft representation at least partly on the basis of the reliability values from said decoder.

In the same field of endeavor, Brink teaches de-mapper is a soft de-mapping device that has been modified in order to receive a priori information obtained from the decoder. The iterative decoding and de-mapping can be iterative decoding process whereby the inner decoder is replaced by the soft de-mapping device (page 3, [0016]). Furthermore, it teaches mapping store for storing a plurality of different mappings and means for determining iterations and selecting the optimum mapping information (col. 5 lines 29-51).

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of the invention to incorporate such de-mapping device, as taught by the Brink, in to the combined system of Schilling and Onggosanusi, as a whole, so as to de-mapping the received decision data based on the soft information generated by the soft decoder or FEC decoder, the motivation is to provide improved bit error rate (page 3, [0016]).

Regarding claim 18, Schilling discloses multiplexer connected to FEC decoder (Fig. 3), but do not explicitly discloses decoder being operative to produce a set of information symbols for each decision data set in the sequence of decision data sets.

In the same field of endeavor, as shown in Fig. 4, decoder is connected to the de-mapping device to de-map the data based on soft information from the decoder. Furthermore, decoder as show in Fig. 4 being operative to transform the soft information provided by the de-mapping device into stream of symbols and further provided to hard decision data to provide the received data (Fig. 4).

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of the invention to produce a set of information symbols for each decision data set in the sequence of decision data sets, as taught by Brink, into the system of both Schilling and Onggosanusi, as a whole, the motivation is to provide improved bit error rate (page 3, [0016]).

Regarding claim 19, the combined teachings of both schilling and Onggosanusi do not explicitly discloses the system defined in claim 18, wherein said decoder being operative to produce a set of information symbols for each decision data set in the sequence of decision data sets includes said decoder being operative to select one of a predetermined set of information symbols on the basis of the contents of the particular data set.

In the same field of endeavor, Brink teaches SISO decoder in which a soft values represents the reliability on the bit decision of the respective bit symbols. a soft in decoder accepts the reliability information for the incoming bit symbol. A soft out decoder provides soft reliability values on the outgoing bit symbols. The demapping

device is selecting the optimum mapping data based on channel conditions (col. 8, [0034] and col. 11 lines 32-36).

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of the invention to produce a set of information symbols for each decision data set in the sequence of decision data sets, as taught by Brink, into the system of both Schilling and Onggosanusi, as a whole, the motivation is to provide improved bit error rate (page 3, [0016]).

Regarding claim 20, Brink further discloses the system defined in claim 19, wherein each set of information symbols in the predetermined set of information symbols corresponds to a respective point in a constellation (Figs. 4-7, constellation mapping)

Regarding claim 21, Schilling further discloses the system defined in claim 1, wherein said space matched filter is further operative to obtain the channel data elements from an external source (Fig. 3, each match filtered received sequence is matched with impulse response).

Regarding claim 22, Schilling is silent about the system defined in claim 1, wherein said space matched filter is further operative to compute the channel data elements based on measurements of the communications channel.

In the same field of endeavor, Onggosanusi teaches matched filtering coefficient is calculated as channel estimation for the channel paths from transmitter antenna to receiver antenna (col. 4 lines 61-65) .

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of the invention to combine the teachings of Schilling and Onggosanusi, as a whole, so as to provide motivation as explained in claim 1.

Regarding claim 24, the combined teachings of both Schilling and Onggosanusi further discloses the system of claim 17, further comprising an interference reducing filter (Onggosanusi, Fig. 2e, interference resistance detection) disposed between said space matched filter (Schilling, Fig. 3, space time combining) and said detector (Schilling, Fig. 3, FEC decode).

Regarding claim 25, Ongosanusi further discloses the system of claim 24, wherein the interference reducing filter comprises a minimum mean square error (MMSE) filter (col. 13 lines 6-10, MMSE)

6. **Claims 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Schilling and Onggosanusi, as applied to claim 1 above, and further in view of Langberg et al. (US 5, 852, 630) (hereafter Langberg).**

Claim 28 discloses all the subject matter as recited in claim 1 above except for computer-readable store medium containing a program element for execution by a computing device.

In the same field of endeavor, Langberg teaches that the method and apparatus for a transceiver warm start activation procedure with precoding that can be implemented in software stored in a computer readable medium. The computer readable medium is an electronic, magnetic, optical or other physical device or means that can be contain or store a computer program for use by or in connection with computer related system or method (col. 3 lines 51-65). One skilled in the art would have easily recognized that the method of both Schilling and Onggosanusi would have been implemented in software. The implemented software would perform same function of the hardware for less expense, adaptability and flexibility. Therefore, it would have been obvious to one of ordinary skilled in the art at the time of the invention was made to use the software as taught by Langberg in the " Schilling and Onggosanusi" in order to reduce the cost and improve the adaptability and flexibility of communication system.

7. **Claims 34-36 rejected under 35 U.S.C. 103(a) as being unpatentable over Schilling and Onggosanusi , as applied to claim 1 above, and further in view of Forsythe et al. (US 6,745,050) (hereafter Forsythe).**

Regarding claim 34, the combined teachings of both Schilling and Onggosanusi discloses all the subject matter except a system for estimating for data transmitted from

each of a plurality of users and the method and jointly process the space matched filtering for each user.

In the same field of endeavor, Forsythe teaches multi channel multi-user detection technique in which number o wireless signals are received at several antennas (32a-32d). Several instantiations of detections 56a-56c, each corresponding to the particular user, are invoked, after correlating process, the signals are selected from the best taps are processed via space time adaptive method. The signal are then matched filtered (62) and signal decision occurs (col. 6 lines 23-33).

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of the invention to combine the teachings of Forsythe, into the system of both Schilling and Onggosanusi, as a whole, so as to perform the method as disclosed by both Schilling and Onggosanusi, into the multi user detection process in which each user is associated with the particular antenna, the motivation is to perform efficient multi channel multi-user detection (abstract).

Regarding claim 35, Fortsythe further discloses the system, wherein the number of transmit elements for each user is greater than one (Fig. 9).

Regarding claim 36, Fortsythe further discloses the system, residing in a base station (col. 4 lines 29-30, furthermore, one of ordinary skilled in the art would easily recognized that this system can be employed either in the base station or at the user terminal since both require the signal detection for decisions).

Allowable Subject Matter

8. Claims 9 and 23 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patel Dhaval whose telephone number is (571) 270-1818. The examiner can normally be reached on M-F 8:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shuwang Liu can be reached on (571) 272-3036. Customer Service can be reached at (571) 272-2600. The fax number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Dhaval Patel/

Examiner, Art Unit 2611

9/22/2008

/Shuwang Liu/

Supervisory Patent Examiner, Art Unit 2611